AGRICULTURAL NEWS LETTER

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THIS PUBLICATION GIVES INFORMATION on new developments of interest to agriculture based on the work done by chemists and agricultural field men of the du Pont Company and its subsidiary companies.

It also gives reports of results obtained with products developed by these companies in the field whether the tests are made by field men of the companies, by agricultural experiment stations or other bodies. Also data on certain work done by agricultural stations on their own account and other matters of interest in the agricultural field.

This issue contains:

Issued by du Pont Company,
Wilmington, Delaware,
F. J. Byrne, Editor.

IMPORTANT -- YOUR ATTENTION, PLEASE!

In sending you the Agricultural News Letter, it has been our hope that the material contained is informative and of practical value. Having received a copy each month for some time, you have had an opportunity to decide whether you would care to have us continue sending the News Letter. Therefore, please advise us as to your wish in the matter. An addressed postal card is attached.

Further, we should be glad to have your comments, suggestions and frank criticism of the News Letter. If desired, this sheet may be used for that purpose.

AGRICULTURAL NEWS LETTER,
E. I. DU PONT DE NEMOURS & CO.,
WILMINGTON, DELAWARE,
BY: F. J. BYRNE, EDITOR.

Name ....Address....................

City.........................State......................

FERTILIZERS FOR COTTON IN ALABAMA DISCUSSED IN PRELIMINARY REPORT OF EXPERIMENT STATION

EDITOR'S NOTE:- The quotations below are from a preliminary report on fertilizers for corn and cotton in Alabama. It has been issued by the Alabama Agricultural Experiment Station, Auburn, Ala., M. J. Funchess, Director. These data were presented at a field meeting held at the Sand Mountain Substation, Crossville, Ala., on August 30, 1934. It is to be understood that only excerpts from the report are given, and it will be noted that Table 3 is the only one reproduced, and this one not in its entirety.

"During the past four years field experiments have been conducted for the purpose of determining the best grade of fertilizer for corn and cotton. These tests are being conducted at eight different places in the State as follows: Substations;-Sand Mountain, Tennessee Valley, and Wiregrass; Experiment Fields;-Alexandria, Aliceville, Brewton, Monroeville, and Prattville. The results obtained at these places should give a very accurate picture of the results expected in the State.

"It is the purpose of this paper to discuss the results which have been obtained from the use of different grades of fertilizers for corn and cotton during the past four years. In these experiments, the corn and cotton were grown on the same land in alternate years."

"COTTON -- For cotton production, many different grades of complete fertilizers are used in Alabama. Some of these fertilizers must be more efficient than others. It was the purpose of the test, discussed below, to determine the most economical grade of fertilizer for cotton in this region. The results are shown in Table 3. In Table 4 are shown the average yield of cotton obtained at each of the eight tests so that the reader may make calculations of the profits or losses obtained from the use of a particular fertilizer at any or all of the Substations or Experiment Fields where this test is being conducted."

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"Nitrogen -- Six hundred pounds of a complete fertilizer, which contained 10 percent phosphoric acid and 4 percent potash and the nitrogen content varied from 0 to 6 percent were used. The 0-10-4 fertilizer made an average yield of 496 pounds of seed cotton per acre less than the 6-10-4, and the 2-10-4 made 294 pounds less than the 6-10-4, while the 4-10-4 made 212 pounds less than the 6-10-4. Obviously, the most economical fertilizer for cotton in this test was the one which produced the most cotton at the lowest cost or the one which gave the greatest returns per acre. In making such calculations, it is necessary to place a value on the cotton produced by each of the fertilizers, to consider the cost of each fertilizer, and the cost of picking and ginning the cotton. After these considerations, it was found (Table 3) that the fertilizer which contained no nitrogen gave $19.63 worth of cotton per acre, the fertilizer which contained 2 percent nitrogen gave $24.81 worth of cotton, the fertilizer which contained 4 percent nitrogen gave $28.70 worth of cotton, and the fertilizer which contained 6 percent nitrogen gave $31.63 worth of cotton. It should be remembered that in each case, the cost of the fertilizer and the cost of picking and ginning have been deducted. Therefore, the returns per acre for other costs and profits depend upon the amount of nitrogen in the fertilizer; this return varied from $19.63 to $31.63 per acre. The difference in returns from the 4 and the 6 percent nitrogen was $2.93 in favor of the latter.

"Recommendation for Cotton Fertilization -- Most of the fertilizers which have been used for cotton contained more phosphate and less nitrogen than were needed. In the light of the results discussed above, it would appear that the best fertilizer for cotton in Alabama would be one that supplied at least 36 pounds of nitrogen from 36 to 48 pounds of phosphoric acid, and 24 pounds of potash per acre. This would require a 6-6-4 or a 6-8-4 fertilizer used at the rate of 600 pounds per acre. It is possible that the amount of potash in this mixture could be profitably reduced, but more time will be required to definitely determine this point.

"Popular Cotton Fertilizers -- The last four lines in Table 3 show the inefficiency of four grades of fertilizers which are very popular for cotton in Alabama. These fertilizers were less efficient than the 6-10-4 by the amounts of seed cotton per acre as follows: 4-8-4, 153 pounds; 3-8-5, 240 pounds; 3-10-3, 216 pounds; and 2-11-3, 287 pounds. Space does not permit a discussion of the inefficiency of each of these grades. The 3-8-5, as a fertilizer for cotton, will be briefly discussed since it is the most popular grade used in the State. From the last column of Table 3, it was calculated that the 3-8-5 was less efficient than the 6-6-4 by $5.30 per acre. The quantity of 3-8-5 used in Alabama during 1933 was about 99,528 tons or 36.9 percent of the total mixed fertilizers used in the State. This quantity would be sufficient to fertilize 331,520 acres if used at the rate of 600 pounds per acre. Now, if this fertilizer

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had been replaced by a good grade of fertilizer (6-6-4 or 6-8-4) the difference in the value of the cotton crop, after paying for the fertilizer and picking and ginning of the seed cotton would have been approximately $1,757,000."

Table 3. -- The Average Yield of Seed Cotton, Pounds per Acre, When 600 Pounds per Acre of Various Grades of Fertilizers were Used and the Returns per Acre at Three of the Substations and Five of the Fields 1930-1933 Inclusive.

Fertilizer	Yield 4-Yr. Ave.	Value of Cotton Per Acre (1)	Value of Cotton per Acre less cost of fertilizer, ginning and picking (2)
N-P-K	lbs.		
6-6-4	1,207	$48.28	$31.61
6-8-4	1,240	$49.60	$31.97
6-10-4	1,251	$50.04	$31.63
6-10-2	1,204	$48.16	$30.69
6-10-4	1,251	$50.04	$31.63
6-10-6	1,262	$50.48	$31.42
0-10-4	755	$30.20	$19.63
2-10-4	957	$38.28	$24.81
4-10-4	1,119	$44.76	$28.70
6-10-4	1,251	$50.04	$31.63
4-8-4	1,098	$43.92	$28.72
3-8-5	1,011	$40.44	$26.31
3-10-3	1,035	$41.40	$26.94
2-11-3	964	$38.56	$24.95
6-10-4	1,251	$50.04	$31.63

(1) Seed Cotton Valued at 4 cents per pound.

(2) Cost of Fertilizer - Nitrate of soda $35 per ton; superphosphate $18.75 per ton; Muriate of potash $47.47 per ton. A charge of 50 cents per 100 Pounds of seed cotton was made for picking and a charge of $4 was made for ginning 1400 pounds of seed cotton.

THE NEW EUROPEAN INSECT THAT DESTROYS ALFALFA BELONGS TO A FAMILY ALREADY REPRESENTED HERE.

EDITOR'S NOTE:- In the November number was published a valuable and informative article, by Dr. P. W. Claassen, on the new insect discovered in alfalfa fields in New York State. Dr. Dietz's article presented here, discusses two other species of beetles which belong to the same family as the so-called snout beetle now found in New York.

By: Harry F. Dietz, Research Entomologist,
Grasselli Chemical Company,
Cleveland, Ohio.

Early in the year 1933, an unrecognized snout beetle was found feeding on newly set raspberry plants near the city of Oswego, New York. Later in the same year the grubs or larvae of this insect were found doing considerable damage to alfalfa fields, by eating the roots and thus causing the death of the plants. The identification of the beetles and grubs by experts of the United States Department of Agriculture showed that this insect was an undesirable alien, introduced from Europe. It was identified as Brachyrhinus ligustici Linneaus. It belongs to a destructive family of weevils popularly designated as the grape root weevils.

We already have two destructive weevils of this family in this country, one of which is most certainly a comparatively recent introduction from Europe and the other of which is probably of European origin, but was introduced so long back that such introduction can only be surmised.

The first of these insects mentioned in the preceding paragraph is the so-called "black vine weevil" Brachyrhinus (formerly known as Otiorhynchus) sulcatus Fabricius. It is a serious pest on strawberries, and ornamental horticultural plants out-of-doors and on pot plants in the greenhouse (ferns, cyclamen, etc.,). Recently this species has caused serious damage to certain evergreens (yews, young spruce, and hemlock) in landscape plantings at Cleveland, Ohio.

Since both adults and young (grubs) feed under ground on the roots, control is difficult and no very satisfactory means of control for out-of-doors has been devised. Mixing lead arsenate into the soil as is done in greenhouse control has been tried with indifferent success.

In the greenhouse, the adults are nocturnal foliage feeders and some success in control has been obtained by handpicking, by dusting or spraying with lead arsenate and by thoroughly mixing lead arsenate with the potting or bench soil before plants are set.

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Another species, the one mentioned as having been introduced a long time back, is known as the "strawberry crown girdler" Brachyrhinus ovatus Linneaus in most localities. In the New England States it is called the "graveyard beetle" because of its introduction into cemeteries on ornamental shrubbery.

The usually recommended control for the strawberry crown girdler is spraying with lead arsenate at the rate of four pounds per 100 gallons.

Both the black vine weevil and the strawberry crown girdler, like the newly introduced species referred to in the article in the November issue of the Agricultural News Letter, cannot fly because their wing covers are sealed to the body and the flying wings are not developed. Hence, the greatest dissemination of these insects is by artificial (man-made) means, such as the movement of infested plants, soil or the packing material used in shipping plants from one place to another.

It will be noted that the habits of this newly introduced species are somewhat like those of two species that already occur in the Eastern United States and which are quite destructive. The outstanding differences seem to be (1) the parthenogenetic reproduction of the newly introduced species, (2) and the very long-time feeding of the adults below ground.

Since barium fluosilicate has proved quite effective in the control of certain other species of weevils, it is worth while to bear in mind that it might prove equally useful for the group known as the "grape root weevils."

SEED DISINFECTION INCREASES COTTON YIELDS FOR SIXTEEN TEXAS GROWERS IN SIX COUNTIES

EDITOR'S NOTE:- The value of two percent ethyl mercury chloride* as a cotton seed disinfectant was demonstrated in these Texas tests by increases in stands ranging from 25 percent to more than 200 percent with an average increase of 71 percent, and a yield average increase of 13.6 percent.

*"2% Ceresan."

By: H. C. Bucha, Plant Pathologist,
Research Department, Bayer-Semesan Co.,
Wilmington, Delaware.

Sixteen Texas cotton growers recently enjoyed the opportunity of observing at first hand the effect of cotton seed treatment on their own farms. This opportunity came in the form of tests conducted in Bexar, DeWitt, Falls, McLennan, Tarrant, and Dallas Counties for the purpose of securing reliable information as to the benefit which the average cotton grower might reasonably expect from seed treatment.

To make the comparisons as accurate as possible treated and untreated seed were planted in alternate rows on each of the 16 farms, each test occupying one to two acres of land. Before chopping out, a count of the stand was made, which disclosed that in every case the treated rows had a decidedly better stand of plants than the untreated rows. In most of the tests the increases in stand as a result of seed treatment was at least 25 percent and in some cases it was more than 200 percent, the average increase in stand for the 16 farms being nearly 71 percent. In other words, for every 100 plants in the untreated rows there were about 171 plants in the treated rows. As a result of this improvement it was possible, while chopping out, to leave a much more uniform and better stand of plants in the treated rows.

After chopping out, a count of the plants in the treated and the untreated rows was again made. It was found that the treated rows had over 25 percent more plants than did the untreated rows. Thus for every 100 plants in the untreated rows, there were about 125 plants in the treated rows.

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Most interesting of all to the cotton growers, however, was the effect of seed treatment on the yield. In most cases the yields were far below normal because of the lack of sufficient moisture. Nevertheless, on nearly every farm the treated rows outyielded the untreated rows by 25 to 100 pounds of seed cotton per acre, the average percent increase in yield being 13.6.

Growers who cooperated in conducting the tests figured that this increase in yield was secured at an expense of only about ten cents per acre, this being the cost of the chemicals used in treating the seed.

The results of these farm tests will be of particular interest to those growers who are somewhat hesitant to adopt new methods until their value has been proved under actual farm conditions. The sixteen tests described above were all conducted in strict accordance with the practices prevailing on the respective farms.

The advantages of treating cotton seed have been described by the Agricultural Experiment Stations for several years and cotton seed treatment has become an established practice on progressive cotton farms. The information gained from the Texas tests during 1934 simply confirms the statement that cotton can be grown without seed treatment but that it can be grown much more profitably by treating the seed and thus greatly improving the stand and the yield per acre.

SYNTHETIC CONTACT INSECTICIDES OFFER MORE EFFICIENT CONTROL POSSIBILITIES

EDITOR'S NOTE:- We present here a further discussion of the possibilities of more effectual control of destructive insects which are expected to result from scientific research being carried on in laboratories of the du Pont Company and its subsidiaries. The subject has been discussed in previous issues of the Agricultural News Letter.

By: Dr. Paul L. Salzberg, research chemist for the du Pont Company.

We have discussed in previous articles the role of synthetic organic chemistry in the development of arsenical substitutes for chewing insects and its relation to the problem of spray residues on fruit and vegetables. Of parallel interest is the recent application of both organic and physical chemistry in the syntheses of new contact insecticides for controlling sucking insects which cannot be reached by the application of poisons to the surface of foliage and fruit. It has been recently pointed out that the most advantageous feature of an insect in its war against man is that its skeleton is worn on the outside in the form of an armor instead of inside in the form of bones merely as a support. One of the most important phases of the development of efficient contact insecticides, therefore, resolves itself into finding means of penetrating this protective coating of chitin and wax.

For many years plant extractives such as nicotine and pyrethrum have been the standard contact insecticides. The complexity of these products has precluded commercial syntheses, and the study of their chemical constitutions in relation to efficiency has offered few leads of value. More success has recently been obtained by starting from the ground up and building an entirely new type of contact insecticide on the foundation of scientific principles governing the mode of action of these products. Much valuable information has already been obtained by the various agricultural experiment stations which throws light on the physical properties that are required before an insecticide can possess the desirable penetrating qualities. Contact insecticides may enter the body of an insect through the trachae either in the vapor form as a fumigant or in the liquid state. In the latter case, with which we are mainly concerned, the liquid must spread over the surface of the insect and enter the trachae by capillary attraction. The first prerequisite of a suitable contact insecticide, therefore, is that it should have the optimum surface tension, viscosity, adhesion and cohesion characteristics.

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Fortunately these properties lend themselves readily to laboratory determinations, and much is known concerning the relationship of structure to various physical properties of this type. By applying these principles it has been possible to develop contact insecticides which even surpass nicotine in their efficiency for certain types of insects, particularly those which protect themselves by the exudation of a waxy coating.

It goes without saying that in addition to the requisite physical properties, a contact insecticide must have the necessary chemical constitution to possess toxicity once it has entered the body of the insect, but that is another story reserved for future discussions.

WEST VIRGINIA FIELD DEMONSTRATIONS SHOW CONTROL FOR INSECTS ON POLE LIMA BEANS AND GOOSEBERRIES

EDITOR'S NOTE:- A Grasselli field man has reported some interesting information on the use of barium fluosilicate* on pole and bush lima beans, and gooseberries in West Virginia. Some of the results of his findings are given below.

(* Dutox)

Demonstrations of the use of barium fluosilicate for the control of certain insects were given in some sections of West Virginia, which are important areas for the production of truck crops and small fruits. In a number of house gardens, the insecticide was applied for the control of the green worm that strips the foliage from currant and gooseberry bushes. These worms appear when the plant is very small, and if not controlled, a crop of fruit cannot be expected. The worms do not eat the fruit, but due to their feeding activities on the foliage, further growth of the fruit ceases. Barium fluosilicate was used here at the rate of two level tablespoonfuls to each gallon of water -- all worms were killed within twelve hours. Arsenicals have rarely proved satisfactory in controlling these worms.

It was further reported that excellent control was obtained on pole or running lima beans for the Mexican bean beetle. No grower in the section had ever secured satisfactory results with arsenical sprays -- calcium arsenate giving practically no kill at all; magnesium arsenate gave a good kill but was highly injurious to the bloom, as pole limas must be sprayed while covered with bloom, as they bear and bloom at the same time. Incidentially, in the section, the beans are shelled and sold in the green state in the local market.

The only beans grown in this section were those sprayed with barium fluosilicate; other crops, that were not sprayed or were sprayed with other materials were a total loss. The spray used consisted of two pounds of barium fluosilicate to fifty gallons of water. This was applied with the nozzle of the sprayer inserted under the leaves, and the spray was forced upward, moving the nozzle toward the tops of the poles. As pole limas continued to put on new growth, it was found necessary to continue the spraying at intervals of ten days. Observers of the results expressed the view that any grower of pole lima beans who follows this schedule can adequately protect his crop from the Mexican bean beetle.

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Barium Fluosilicate may also be used successfully on bush limas and other types of beans, reports indicate.

The Grasselli field experimenter also reported a clean-up of rose chafers on grapes, using barium fluosilicate one and one half pounds, Bordeaux mixture eight pounds, and one half gallon of heavy syrup to fifty gallons of water.

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USE OF UREA-AMMONIA LIQUOR IN FERTILIZERS EFFECTS MARKED SAVINGS IN LIMESTONE COSTS

EDITOR'S NOTE:- The data given here has been abstracted from "Formulating Non-Acid Forming Fertilizers With Anhydrous Ammonia and Urea-Ammonia Liquor," published August 1934, by the Ammonia Department, du Pont Company.

Mehring and Peterson (1) have shown that prior to 1906 American complete fertilizers were, on the average, slightly basic and that from 1906 to 1925 they were only slightly acidic. From 1925 to 1932, however, the potential or equivalent acidity* of complete fertilizers increased from 40 to 161 pounds of calcium carbonate per ton, an increase of 300 percent. Their data indicate that in several states the equivalent acidity of the complete fertilizers sold will exceed 200 pounds of calcium carbonate per ton.

(1) - Mehring, A. L. and Peterson, A. J. The equivalent physiological Acidity or Basicity of American Fertilizers. Jrl. Assoc. Offic. Agr. Chem., Feb. 1934.

(*) - Equivalent acidity is defined as the acidity developed in the soil by the fertilizer measured in terms of calcium carbonate required for its neutralization. It may be expressed as pounds per ton or per cent. Equivalent basicity refers to the basic residue left in the soil by fertilizers, expressed as equivalent calcium carbonate.

Urea-Ammonia Liquor Least Acidic Combination

Data show that per unit of nitrogen added, Urea-Ammonia Liquor is less acidic than any other combination except 6. (Table 1) Combinations 4 and 5 show that whereas cyanamid is basic, the combination of reasonable amounts of cyanamid and ammonium sulfate is decidedly more acidic than Urea-Ammonia Liquor. Urea-Ammonia Liquor also carried more organic-nitrogen than combinations 4 and 5. Combination 6 shows that a cyanamid-ammonium sulfate mixture has as low an equivalent acidity as Urea-Ammonia Liquor when the quantity of cyanamid is 2.96 times as great as the quantity of inorganic nitrogen in the Urea-Ammonia Liquor. Such a quantity of cyanamid is more than can be used to good advantage.

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The last column of figures in Table 1 shows that Urea-Ammonia Liquor with limestone equivalent to its potential acidity contains a higher percentage of nitrogen than any other combination. Consequently, Urea-Ammonia Liquor is particularly useful in formulating non-acid-forming fertilizers in which only a limited quantity of dolomite can be used in the formula.

Urea-Ammonia Liquor Reduces Limestone Costs

The cost of limestone required to neutralize the potential acidity of a unit of nitrogen from Urea-Ammonia Liquor, sulfate of ammonia and various combinations of sources is shown in Table 2. The combinations correspond to 1 to 5 of Table 1. Limestone is figured at $2.40 and $3.00 per ton. The difference between the cost of limestone for Urea-Ammonia Liquor and the other sources of nitrogen is shown in the fourth and last columns of the table.

The data show that with limestone at $2.40 and $3.00 per ton the Anhydrous Ammonia-ammonium sulfate combination has an acidity or limestone credit over ammonium sulfate of 5.70 and 7.13 cents per unit of nitrogen. With limestone at $2.40 per ton Urea-Ammonia Liquor has a credit of 8.52 cents per unit of nitrogen over ammonium sulfate, 2.82 cents per unit over Anhydrous Ammonia-ammonium sulfate, and of 4.69 cents to 2.72 cents over the cyanamid-ammonium sulfate combinations. If limestone costs $3.00 per ton, Urea-Ammonia Liquor has an acidity credit of 10.65 cents per unit of nitrogen over ammonium sulfate and of 5.86 cents to 3.40 cents per unit of nitrogen over the cyanamid-ammonium sulfate combinations. If, as is usually the case, two or three units of nitrogen in mixed goods or a base are derived from Urea-Ammonia Liquor, the savings in limestone costs per ton of fertilizer would be two or three times the figures given in the fourth and last columns of Table 2.

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TABLE 1

Equivalent Acidity and Nitrogen Content of
Combinations of Nitrogenous Materials
Having the Same Content of Total Nitrogen

No.	Material	Pounds Per Ton	Nitrogen Pounds	Equiv. Acidity lbs. $CaCO_3$ Total	Equiv. Acidity lbs. $CaCO_3$ Per Unit N	Percent Nitrogen Without Limestone	Percent Nitrogen With Limestone*
1	Urea-Ammonia Liquor	98.9	45.0	81	36.0	45.5	25.0
2	Anhydrous Ammonia	36.4	30.0	54			
	Ammonium Sulfate	73.3	15.0	80			
	Total	109.7	45.0	134	59.5	41.0	18.4
3	Crude Nitrogen Solution	81.8	36.0	43			
	Ammonium Sulfate	43.9	9.0	48			
	Total	125.7	45.0	91	40.0	35.8	20.8
4	Cyanamid	40.0	8.8	25 B			
	Ammonium Sulfate	176.6	36.2	194			
	Total	216.6	45.0	169	75.1	20.9	11.7
5	Cyanamid	60.0	13.2	38 B			
	Ammonium Sulfate	155.6	31.8	170			
	Total	215.6	45.0	132	58.7	21.1	12.9
6	Cyanamid	88.8	19.5	56 B			
	Ammonium Sulfate	124.4	25.5	137			
	Total	213.2	45.0	81	36.0	21.3	15.3

*Limestone equivalent to potential acidity

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TABLE 2

Cost of Limestone to Neutralize Potential Acidity of
Various Combinations of Nitrogenous Materials

No.	Material	Limestone $2.40 Per Ton		Limestone $3.00 Per Ton	
		Limestone Cost Per Unit N	Limestone Cost Less UAL Limestone Cost Per Unit N	Limestone Cost Per Unit N	Limestone Cost Less UAL Limestone Cost Per Unit N
		Cents	Cents	Cents	Cents
1	Urea-Ammonia Liquor	4.32	---	5.40	---
2	Anhydrous Ammonia-Ammonium Sulfate	7.14	2.82	8.92	3.52
3	Crude Nitrogen Solution-Ammonium Sulfate	4.80	0.48	6.00	0.60
4	Cyanamid-Ammonium Sulfate	9.01	4.69	11.26	5.86
5	Cyanamid-Ammonium Sulfate	7.04	2.72	8.80	3.40
	Ammonium Sulfate	12.84	8.52	16.05	10.65

BLASTING GARDEN SUBSOIL TO IMPROVE IT RECOMMENDED BY AGRICULTURAL ENGINEERS

EDITOR'S NOTE:- The information on which this article is based was supplied by agricultural engineers connected with the explosives industry who formerly were engaged in agricultural extension work. Complete details of such blasting procedure can be obtained on request.

Farm gardens can in many cases be benefited by subsoil blasting, according to agricultural engineers familiar with the practice in various sections of the country.

The best results are obtained by blasting when the soil is very dry, but as such a soil condition exists usually during the growing period, it obviously is not practicable to blast areas which are planted. However, land that is to be used for garden produce the following season can, of course, be blasted.

Ordinarily, sub-soil blasting is done during the fall, winter and early Spring, and at a time when the soil is in good condition; that is, when it is fairly dry. Blasting frozen ground should not be attempted.

When fertile top soil is underlaid by a thin stratum -- say not more than eight to ten inches -- of hardpan, shale or cemented gravel, so that rainfall cannot seep down and be stored up in the subsoil, and roots cannot penetrate deep enough to afford plants strong growth, it is often beneficial to shatter the impervious material by blasting.

The procedure is to punch holes down to the center of the hardpan or other material, spacing them on six to eight-foot centers, lengthwise and crosswise of the field, and load each hole with a half cartridge of an agricultural dynamite. Each charge is primed with a blasting cap and safety fuse or an electric blasting cap -- usually the former -- and the hole tamped full of earth.

The depth at which the dynamite is loaded is quite important, as it is undesirable to blow out any soil; merely stir it up below the surface or break through impervious material, or both. Soil that is sufficiently dry to blast is seldom distributed at the surface when one-half stick loads are used and holes are punched to a depth of two to two and one-half feet.

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As in the case of all other agricultural blasting, a person who has had no experience in handling explosives should arrange with a practical blaster to do subsoil blasting or, at least, consult his county agricultural agent. Most county agents are well informed on safe and effective blasting practices.

DISINFECTED SEED WAS USED FOR PLANTING FIELD WHERE NATIONAL CORN HUSKING CONTEST WAS HELD

EDITOR'S NOTE:- While, obviously, various factors contributed to the production of a field of corn worthy of selection as the site of the 1934 National Corn Husking Contest, the fact that the corn was grown from treated seed would seem to warrant special mention. The disinfectant used was ethyl mercury phosphate.*

* "New Improved Semesan Jr."

The National Corn Husking Contest was held on November 8, on a farm of the Fairmont Canning Company, near Fairmont, Minnesota. The corn was raised under the supervision of H. E. Blesi. It showed as close to a one hundred percent stand as is mechanically possible. There were no missing hills due to rotting or disease conditions resulting from seed-borne diseases, a fact attributed by Mr. Blesi to dust treatment of the seed corn with ethyl mercury phosphate. In accordance with the requirements of the judges who selected the field, the corn stood up well, had an even stand with not more than three stalks per hill, the plants were uniform in height and size of ears, and the yield was better than average, being estimated at sixty bushels per acre, which was considered unusual in view of the season's weather conditions.

Ted Balko, 29-year-old Redwood, Minnesota, farmer made a net bushel record of 25.78 to win the title of national champion. A throng of fully fifty thousand persons looked on as the eighteen contestants, including state corn husking champions and runners-up, tossed the ears against the bangboards.

PURDUE EXPERIMENT STATION REPORTS RESULTS OF INVESTIGATIONS OF VARIOUS INSECTICIDES

EDITOR'S NOTE:- Below is discussed control of the striped cucumber beetle, Mexican bean beetle, blister beetle and the corn ear worm. These excerpts are from the Department of Entomology section of the Report of the Directors of Purdue University Experiment Station, Lafayette, Indiana, for the year ending June 30, 1933.

"The striped cucumber beetle has been the object of investigation. The calcium arsenate-gypsum mixture has not proven altogether satisfactory in the hands of commercial melon and cucumber growers. Barium fluosilicate has proven to be the most efficient insecticide tested but its use on very young plants is still attended by danger of injuring plants.*

"The Mexican bean beetle extended its range of destructiveness to the northern border of the State in 1932 following the mild winter of 1931-32. Its abundance in the spring of 1933 indicated another year but the increase was somewhat checked by the extended draught and high temperatures. Calcium arsenate continued to give excellent control. Where satisfactory results have not been obtained it is evidently due to improper methods of timing of applications. Barium fluosilicate has also given good control of this pest.

"Blister beetles continue as pests of a large variety of crops. Our experiments in 1933 have again shown the efficiency of fluorine compounds, especially barium fluosilicate.

"Corn ear worm. - Corn ear worm is the limiting factor in the growing of sweet corn for canning purposes in southern Indiana. Experiments in 1932 showed good control with calcium arsenate, arsenate of lead and barium fluosilicate, applied when the first green silks appear and again when most of the green silks are out. This investigation is being continued in 1933."

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*Grasselli statement - Barium fluosilicate is the active ingredient in Dutox. Injury to young cucumber plants can be entirely eliminated where very careful application of the dust is made. Dutox should be applied lightly and evenly to all parts of the cucumber plants for best results.